

# Biological Assessment

For

Proposed Helicopter Landings by the  
Arizona Game and Fish Department within Portions of the  
Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition  
Wilderness Areas for the Purposes of Bighorn Sheep Management



USDA Forest Service, Tonto National Forest  
Cave Creek, Globe, Payson, Pleasant Valley, Mesa, and Tonto Basin Ranger Districts  
Gila, Maricopa, Pinal, and Yavapai Counties, Arizona

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## Introduction

Tonto National Forest (Tonto NF) proposes to authorize the use of helicopters by the Arizona Game and Fish Department within and outside of designated wilderness areas on the Tonto NF for the purposes of desert and rocky mountain bighorn sheep (bighorn sheep) management. Helicopters would be used to, capture, monitor populations, and conduct research of bighorn sheep within portions of the Mazatzal, Hellsgate, Four Peaks, Salt River Canyon and Superstition Wilderness Areas and some areas outside of wilderness (e.g., Parker Creek). These wilderness areas occur on the Payson, Pleasant Valley, Tonto Basin, Mesa, Globe, and Cave Creek Ranger Districts in Maricopa, Gila, Yavapai, and Pinal Counties, Arizona. This action is needed, because bighorn sheep are recognized as an important wildlife resource in the State of Arizona and throughout the rest of their natural range. Establishing and maintaining healthy populations of all subspecies of bighorn sheep is one of the Arizona Game and Fish Department's statewide bighorn sheep management objectives. To meet those objectives, the Arizona Game and Fish Department depends on gathering information on habitat use and vital rates that determine population dynamics through the placement of Very High Frequency (VHF) and Global Positioning System (GPS) radio telemetry collars on individual sheep, as well as augmenting populations of bighorn sheep and introducing animals into currently unoccupied portions of their historic range. These actions may require the use of helicopters in capturing and transport efforts because of steep terrain, extreme seasonal temperatures, and remote locations within wilderness areas. On the Tonto NF, a substantial portion of the bighorn sheep populations occur within designated wilderness areas not accessible by road.

The purpose of this biological assessment (BA) is to review the proposed authorization for the use of helicopters by the Arizona Game and Fish Department within and outside designated wilderness areas on the Tonto NF for the purposes of bighorn sheep management in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, or proposed species below. This BA only addresses helicopter use, capture and monitoring of big horn sheep on the Tonto NF. This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536), and its regulations 50 CFR 402, and follows the standards established in Forest Service Manual Direction (FSM 2672.4-2672.43).

## Consultation History

No prior consultations have been completed for the proposed action.

Table 1 contains determinations for all listed, proposed and candidate species occurring within the project area. Species for which *no effect* determinations were made are not known to occur, do not have suitable habitat available, or occur in habitats/ areas that would not be affected by the proposed action.

**Table 1: Threatened, Endangered, Proposed and Candidate Species Considered and Determinations**

Common name	Scientific name	Status	Determination	Within Project Area
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	No Effect (NE)	No
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	MANLAA	Yes
Mexican Spotted Owl Critical Habitat	Not Applicable (NA)	NA	NE	Yes
Yuma Clapper Rail	<i>Rallus longirostris yumanensis</i>	E	NE	No
Razorback Sucker	<i>Xyrauchen texanus</i>	E	NE	No
Gila Topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	E	NE	No
Narrow-Headed Gartersnake	<i>Thamnophis rufipunctatus</i>	PT	NE	No
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	PT	NE	No
Western Yellow-Billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	P	NE	No
Chiricahua Leopard Frog	<i>Lithobates chiricahuensis</i>	T	NE	No
Arizona Hedgehog Cactus	<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>	E	NE	No
Desert Pupfish	<i>Cyprinodon macularius</i>	E	NE	No
Morafka's Desert Tortoise	<i>Gopherus morafkai</i>	C	Not Likely to Trend Toward Federal Listing	Yes
Headwater Chub	<i>Gila nigra</i>	C	NE	No
Roundtail Chub	<i>Gila robusta</i>	C	NE	No
E – endangered; T – threatened; C – Candidate; P - proposed				

Table 2 contains species and analysis determinations for the proposed action.

**Table 2: Species within Action Area and Determinations**

Species	Species	Listing Status	Determination
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	May Affect, Not Likely To Adversely Affect (MANLAA)
Morafka's Desert Tortoise	<i>Gopherus morafkai</i>	Candidate	Not Likely To Trend Toward Federal Listing
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Bald and Golden Eagle Protection Act (BGEPA)	Not Cause Disturbance or Violate the Bald & Golden Eagle Act
Golden Eagle	<i>Aquila chrysaetos</i>	BGEPA	Not Cause Disturbance or Violate the Bald & Golden Eagle Act

## Critical Habitats Considered

Table 3 identifies Critical Habitat considered within the analysis area. The proposed action would not occur within any of the designated critical habitats listed in Table 3.

**Table 3: Critical Habitats Considered**

Common name	Scientific name	Determination	Within Project Area	Final ruling effective date
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	No Effect	No	19 Oct 2005
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	No Effect	Yes	31 Aug 2004
Narrow-Headed Gartersnake	<i>Thamnophis rufipunctatus</i>	No Effect	No	Proposed
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	No Effect	No	Proposed
Loach Minnow	<i>Tiaroga cobitis</i>	No Effect	No	23 Feb 2012
Spikedace	<i>Meda fulgida</i>	No Effect	No	23 Feb 2012
Razorback Sucker	<i>Xyrauchen texanus</i>	No Effect	No	21 March 2004
Chiricahua Leopard Frog	<i>Lithobates chiricahuensis</i>	No Effect	No	20 March 2012

## Management Direction

### *Forest Service Manual 2670.31 – Threatened and Endangered Species*

1. Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research and Development activities and programs.
2. Establish, through the Forest planning process, objectives for habitat management and/or recovery of populations, in cooperation with states, the Department of the Interior, Fish and Wildlife Service (FWS) or the Department of Commerce, National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), and other federal agencies.
3. Review, through the biological assessment and evaluation process, actions and programs authorized, funded, or carried out by the Forest Service to determine their potential for effect on threatened and endangered species and species proposed for listing.
4. Avoid all adverse impacts on threatened and endangered species and their habitats, except when it is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the Department of the Interior, Fish and Wildlife Service (FWS) or Department of Commerce, National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries); when an exemption has been granted under the act; or when the FWS or NOAA Fisheries biological opinion recognizes an incidental taking. Avoid adverse impacts on species proposed for listing during the conference period and while their federal status is being determined.
5. Initiate consultation or conference with the FWS or NOAA Fisheries when the Forest Service determines that proposed activities may have an effect on threatened or endangered species; are likely to jeopardize the continued existence of a proposed species; or result in the destruction or adverse modification of critical or proposed critical habitat.
6. Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species. Protect individual organisms or populations from harm or harassment as appropriate.

### *Tonto National Forest Land and Resource Management Plan*

- Wildlife and fish habitat elements would be recognized in all resource planning and management activities to assure coordination that provides for species diversity and greater wildlife and fish populations through improvement of habitat. Ensure that fish and wildlife habitats are managed to maintain viable populations of existing native vertebrate species. Improve habitat for selected species. Cooperate with appropriate State Fish and Wildlife agencies. Prevent destruction or adverse modification of critical habitats for Threatened and Endangered species and manage for a goal of increasing population levels that would remove them from the lists (USFS, 1985).
- In accordance with the LRMP, applicable to all management areas, analyze all big horn sheep habitat and continue stocking program in suitable areas in cooperation with Region 6 of the Arizona Game and Fish Department (USFS, 1985). .

- Using desired future condition as a guide; optimize wildlife outputs in all management units by coordination of other resource activities and direct habitat improvement projects. The goal would be to meet projected future demand for consumptive and non-consumptive wildlife use(USFS, 1985).
- Continue close coordination with state and other federal and state agencies for the benefit of plant and animal species. Cooperate and consult with the Arizona Game and Fish Department, Fish and Wildlife Service, universities, professional societies and various conservation organizations regarding proposals and programs concerned with management of wildlife habitat. Maximize coordination with the Arizona Game and Fish Department regarding state listed species and their habitats (USFS, 1985).
- Initiate informal or formal consultation, as required by the Endangered Species Act, with the U.S. Fish & Wildlife Service on all actions that effect T&E plant and animal species (USFS, 1985).
- Continue close coordination with State and other federal agencies for the benefit of plant and animal species (USFS, 1985).

The proposed action would occur within and adjacent to the Mazatzal, Hellsgate, Salt River Canyon, Four peaks and Superstition Wilderness areas on the Tonto NF. Management prescriptions are similar for each of the wilderness areas in the analysis area.

Table 4 contains each wilderness area, the District they occur and Tonto NF Plan Management Area for each.

**Table 4: Wilderness Areas Analyzed, District occurrence and Forest Plan Management Areas**

Wilderness	District	Management Area
Mazatzal	Cave Creek/Mesa/Payson/Tonto Basin	1B, 3A, 4A, 6A
Hellsgate	Payson, Pleasant Valley	4C, 5B
Salt River Canyon	Globe, Tonto Basin	2B, 6G
Four Peaks	Mesa, Tonto Basin	3D, 6I
Superstition	Globe, Mesa, Tonto Basin	2A, 3B, 3C, 6B

Management Emphasis for Management Areas 1B, 3A, 4A, 6A, 4C, 5B, 3D, 6I, 2A, 3B, 3C and 6B : Manage for wilderness values while providing livestock grazing and recreation opportunities that are compatible with maintaining wilderness values, processes and protecting resources (USFS, 1985).

Management Emphasis for Management Areas 2B and 6G: The primary emphasis for this area is the preservation of naturally occurring flora, fauna, aesthetics and ecological processes while providing a very high quality white water river running experience. Special consideration would be given to nesting bald eagle home range requirements. Watershed protection is also an important emphasis, and the stream would be maintained in a free flowing condition with water quality maintained or improved. Other



activities that are authorized by the Wilderness Act would be conducted so as to minimize their impacts on wilderness character (USFS, 1985).

All management areas analyzed have the following management emphasis related to fire: Wildfires would be managed consistent with resource objectives and would be suppressed in accordance with suppression guidelines. Suppression of fires, or portions of fires, would be accomplished where they adversely affect forest resources, endanger public safety or have a potential to damage capital investments. This would be accomplished with a minimum of motorized equipment in wilderness and minimal ground disturbance where possible in any suppression activity (USFS, 1985).

#### *Land and Resource Management Plan Consistency*

We have evaluated whether the proposed action is consistent with the LRMP BO by evaluating whether the proposed action:

- results in effects (to species and/or designated critical habitat) that were analyzed in the BO;
- does not result in exceeding the amount of take issued in the BO;
- meets the assumptions stated in the BO; and
- would result in continuing to implement the Terms and Conditions of the BO

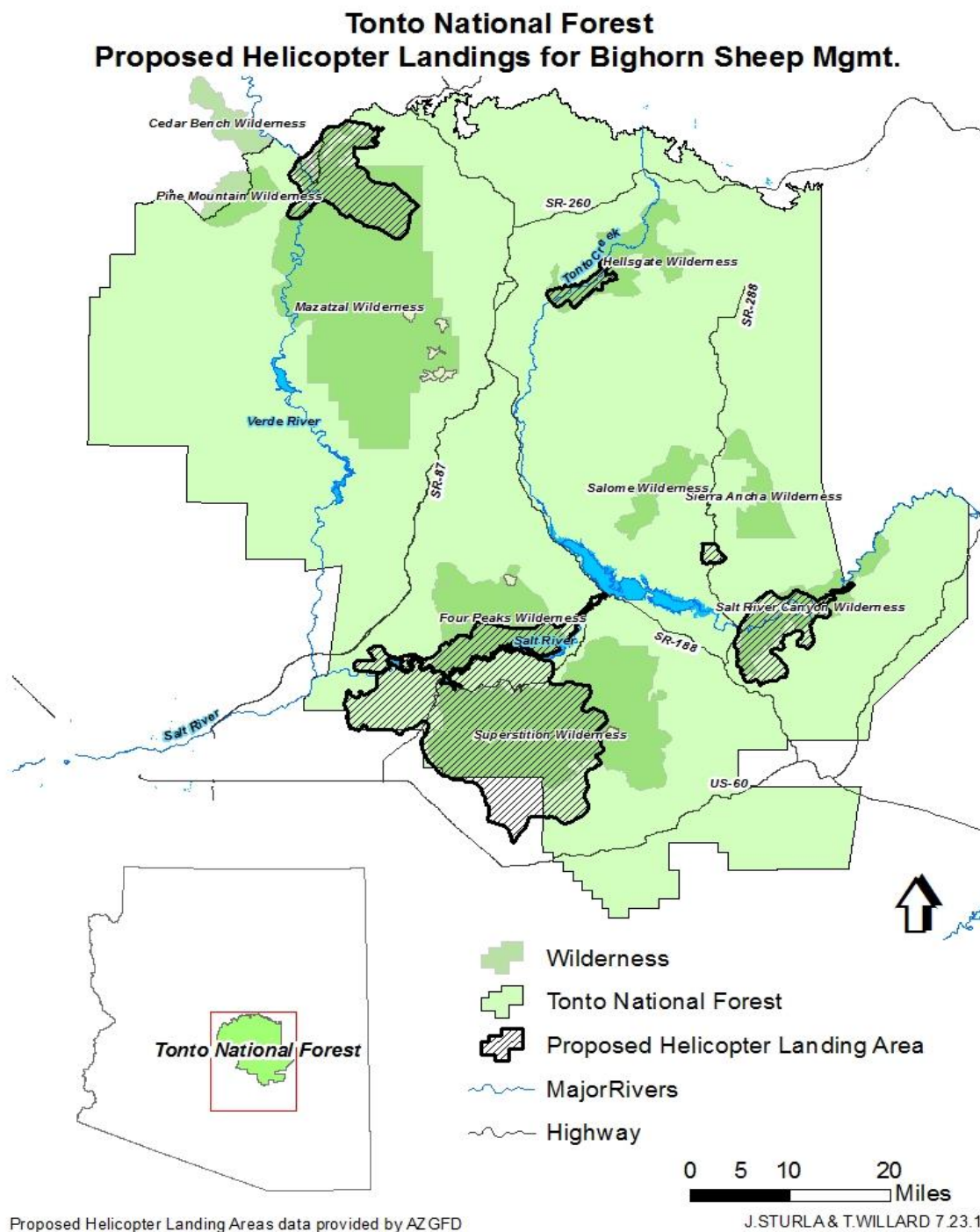
We have concluded that the proposed action has met these criteria, and therefore, is consistent with the LRMP BO.

## **Project Description**

### **Location**

The Tonto National Forest covers approximately 2,964,308 acres in central Arizona and is the fifth largest national forest in the National Forest System. This project area encompasses approximately 296,225 acres of bighorn sheep habitat on the Tonto National Forest that includes portions of five designated wilderness areas: Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas. Approximately 35 percent (189,329 acres) of the project area is within designated wilderness. It ranges from the northern boundaries of the Tonto National Forest near the East Verde River to the southern boundaries of the Tonto National Forest at the Superstition Mountains (Figure 1).

**Figure 1. Map of Tonto National Forest and Affected Wilderness Areas**



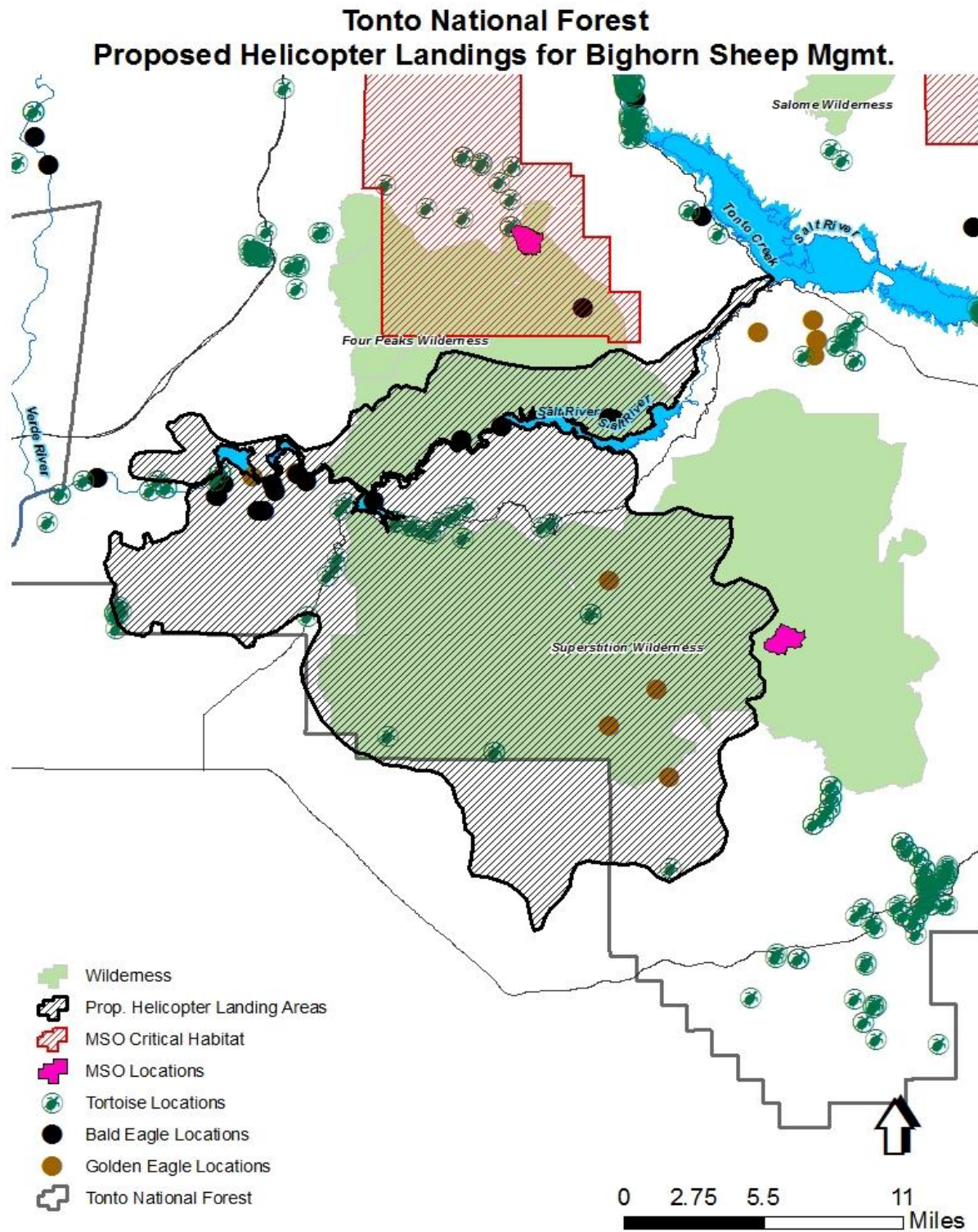
## **Current Condition**

Wilderness and other adjacent areas considered in this analysis provide habitat for bighorn sheep and other species. The analysis area ranges in elevation from 1,500 feet to 5,500 feet. Vegetation communities within the analysis area include: Upland Sonoran, Desertscrub, Semidesert Grassland, Interior Chaparral, and Pinyon Juniper. Portions of the analysis area provide suitable, occupied habitat for desert and rocky mountain bighorn sheep. Much of the area provides preferred habitat for desert bighorn sheep. Desert bighorn preferred habitat in the form of rock outcroppings, precipitous cliffs and rough topography is well documented (Krausman and Valdez, 1999). Rocky mountain bighorn sheep and other bighorn sheep typically inhabit river canyons, foothills, and mountains. Their habitats are generally characterized by rugged terrain including canyons, gulches, talus cliffs, steep slopes, mountain tops and river benches (Krausman and Valdez, 1999). The analysis area contains habitat required for bighorn sheep including remote areas in and outside wilderness.

## **Definition of Action Area**

The project area occurs within the Tonto National Forest and includes portions of wilderness areas described above, where populations of bighorn sheep are known to occur and adjacent areas shown in Figures 2, 3, 4 and 5. The project area consists of smaller segments, i.e. capture areas, which give a more specific location to where captures would most likely occur. These capture areas represent the portions of the project area where known populations of bighorn sheep occur and therefore, where the majority of captures would take place (Figures 2, 3, 4 and 5).

**Figure 2. Proposed Capture/Helicopter Landing Areas for the Four Peaks and Superstition Wilderness Areas.**

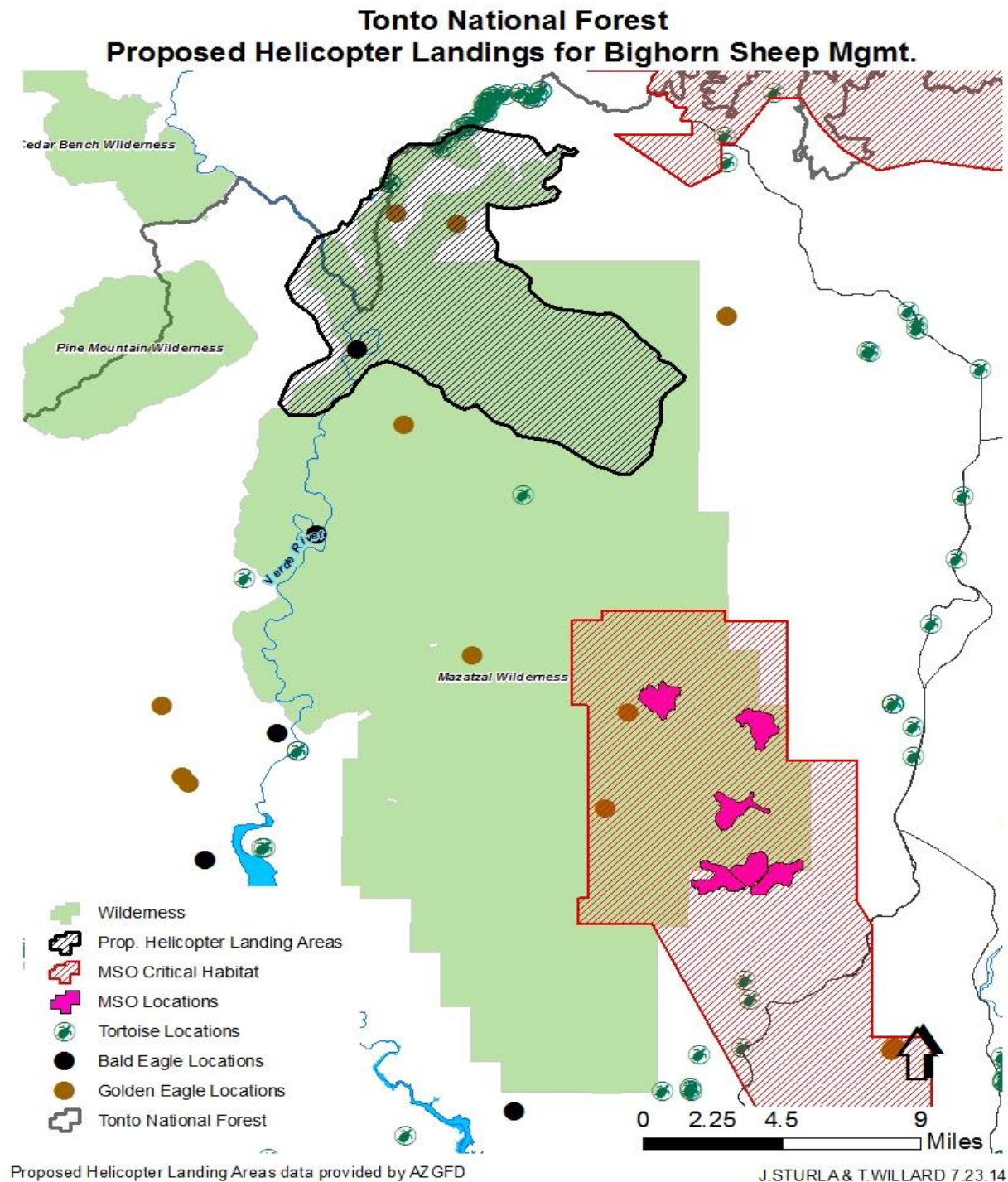


Proposed Helicopter Landing Areas data provided by AZGFD

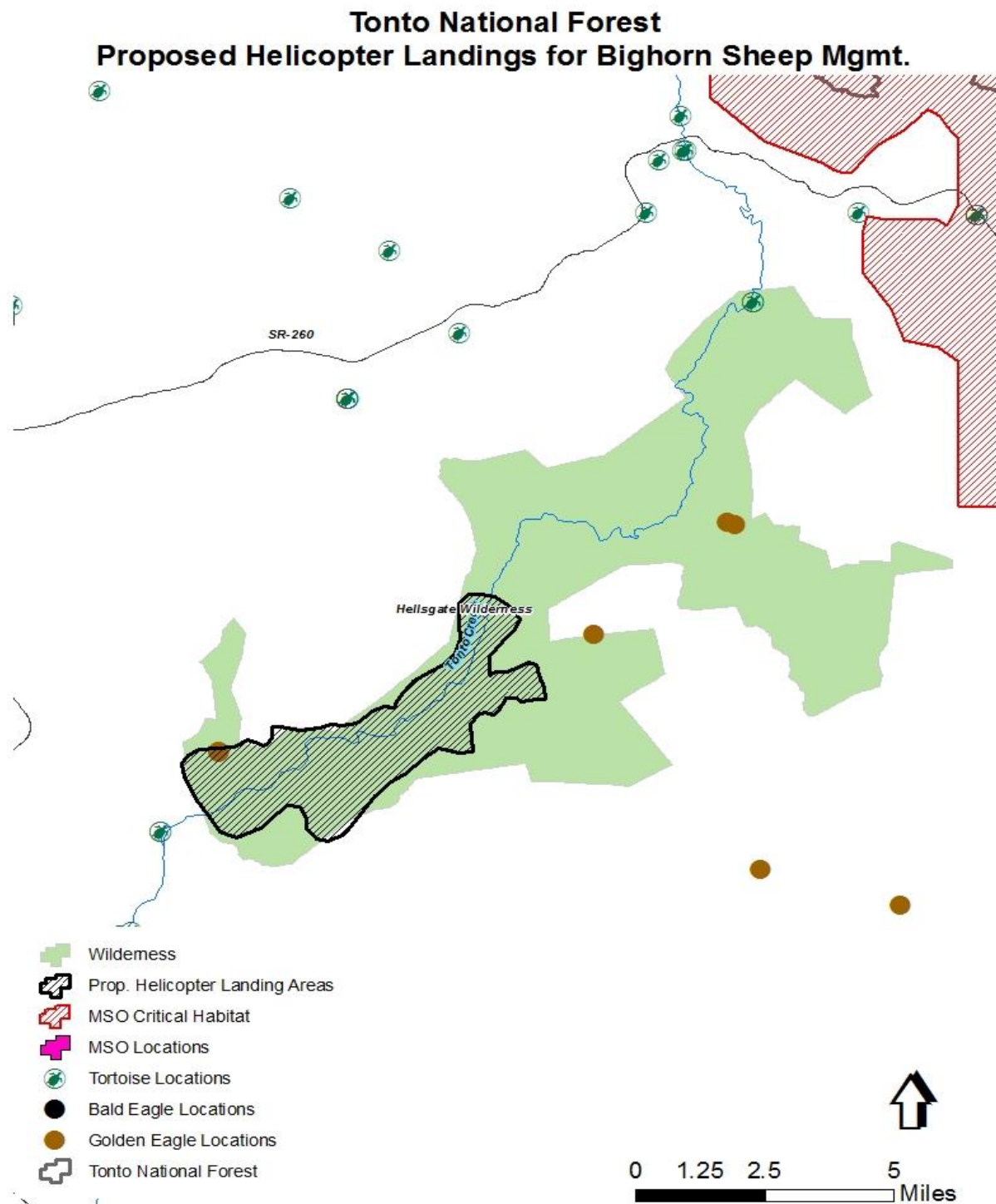
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**Figure 3. Proposed Capture/Helicopter Landing Areas for the Mazatzal Wilderness Area.**



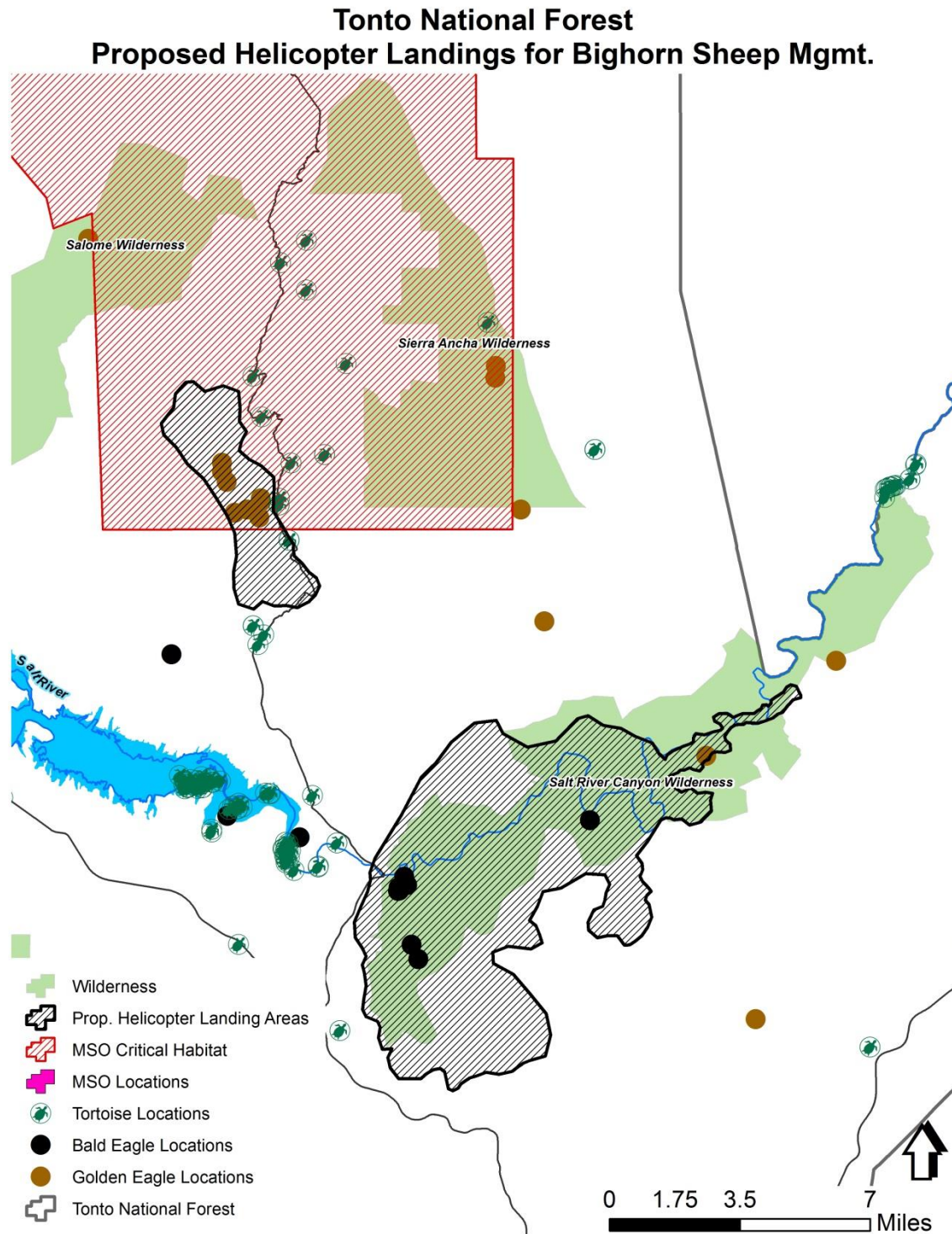
**Figure 4. Proposed Capture/Helicopter Landing Areas for the Hellsgate Wilderness Area.**



Proposed Helicopter Landing Areas data provided by AZGFD

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**Figure 5. Capture/Helicopter Landing Areas for the Salt River Canyon Wilderness Area.**



Proposed Helicopter Landing Areas data provided by AZGFD

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## Proposed Action

The Tonto National Forest proposes to authorize the use of helicopters by the Arizona Game and Fish Department for landings within portions of the Four Peaks, Hellsgate, Mazatzal, Salt River Canyon and the Superstition wilderness areas for a 10 timeframe within the Tonto National Forest. Helicopter landings would be used for bighorn sheep management activities. Up to 60 landings may occur in November and up to 30 landings during other times of the year; however, translocation projects typically do not occur during consecutive years. Although the number of captures and the number of helicopter landings can vary in any given year, they would not exceed 450 landings in wilderness for the 10-year duration of this project, with a maximum of 90 landings occurring per year (Table 5). Based on the history of capture efforts by the Arizona Game and Fish Department, fewer than 45 landings occur per year to accomplish capture goals. Landings constitute any part of the skid of the helicopter touching the ground.

**Table 5: Maximum number of helicopter landings and days for both monitoring and translocation captures of bighorn sheep within wilderness areas**

<b>Wilderness Area and Type of Capture*</b>	<b>Maximum Number of Helicopter Landing in any Given Year</b>	<b>Maximum Number of Days in any Given Year</b>
Four Peaks (T)	30	3
Hells Gate (M)	10	3
Mazatzal (M)	10	3
Salt River Canyon (M)	10	3
Superstition (T)	30	3
<b>Combined Maximum for any Given Year</b>	<b>90</b>	<b>15</b>
<b>Combined Maximum for the Project (10 years)^</b>	<b>450</b>	<b>75</b>

\*M = Monitoring, T = Translocation

^ Captures typically would not occur annually. Captures may occur at an interval of every other year in any given wilderness due to limitations on funding and conservative biological constraints for removing bighorn sheep from any one population.

The area within the Tonto National Forest wildernesses where helicopter landings could be authorized total approximately 189,325 acres total. Based on bighorn sheep survey data gathered by Arizona Game and Fish Department from 2009 to 2012, approximately 56 percent (189,325 acres) of the 296,225 acres of occupied bighorn sheep habitat occurs within wilderness areas, which would be the area where the Department is seeking authorization to land helicopters.

## Conservation Measures

The following design features were created to help minimize potential adverse effects to bald and golden eagles, Mexican spotted owl and Morafka's desert tortoise.

Bald and Golden Eagle:

- Flights would be routed to avoid areas occupied by nesting and foraging bald eagles or nesting golden eagles. At a minimum, a 2,000 foot lateral perimeter buffer would be utilized to eliminate / minimize disturbance to bald eagle breeding and foraging areas and golden eagle nest sites from December 1 through June 30. Nongame Branch possesses bald and golden eagle nest site locations and bald eagle foraging areas are identified by rivers, lakes, and creeks, can be configured into aircraft computers and/or pre-flight plans.
- Crew and pilot would pay close attention to detect any bald or golden eagles in flight and provide any sighting information to Arizona Game & Fish Nongame Raptor Management Program and Forest Service District Biologist(s) and avoid near in-flight misses with aircraft.
- Due to bald and golden eagles ability to establish new nests sites from year to year, any flights between December 1 and June 30 would be coordinated with Arizona Game & Fish Nongame Raptor Management Program to ensure a 2,000 foot altitude and lateral perimeter buffer is maintained between aircraft and bald eagle breeding and foraging areas and golden eagle nest sites. Current species location data would help ensure a buffer is achieved (Jacobsen, 2014).

#### Mexican Spotted Owl:

- Mexican spotted owl (MSO) protected activity centers (PACs) and other updated MSO location information on the Tonto National Forest will be provided to the pilot and crew biologists. Flights would be routed to avoid PACs and/or those areas of nest/roost recovery habitat (suitable, unsurveyed nest/roost habitat) during the breeding season (March – August).
- If a flight cannot avoid PACs or nest/roost recovery habitat during the breeding season, a >345 ft (105 m) hemispherical protection zone (Delaney et al. 1999) would be maintained over known PACs and nest/roost recovery habitat to minimize potential disturbance to MSO.
- Helicopter landings would not occur within known PACs or in suitable nest/roost recovery habitat. All potential landing areas would be outside of PACs and nest/roost recovery habitat.

#### Morafka's Desert Tortoise:

- During landings, safe helicopter operations would be utilized to include landing in areas with large amounts of bare ground to minimize potential conflicts with tortoise(s).
- If tortoises are encountered, protective measures would be consistent with the Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (<http://www.azgfd.gov/hgis/pdfs/Tortoisehandlingguidelines.pdf>), without compromising safe helicopter operations.

## Environmental Baseline

The environmental baseline includes past and present impacts of all federal, state, or private actions in the action area, the anticipated impacts of all proposed federal actions in the action area that have undergone formal or early Section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of

the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

## **Species Environmental Baseline, Effects, and Determination**

### **Bald Eagle – (*Haliaeetus leucocephalus*)**

#### *Historic and Current Status*

Historically, the bald eagle was widespread across North America, mainly Canada and the United States of America. Post European settlement, the species began a significant decline in the late 1800's. The subsequent use of the insecticide dichloro-diphenyl-trichloroethane (DDT) nearly brought the species to extinction before it was banned as a pesticide in the United States in 1973. After decades of conservation and management, the species is now common throughout much of the species' historic range.

In Arizona before the 1970's, there was little information about the size and condition of the bald eagle breeding population. With the exception of two breeding areas, nesting bald eagles occur within one mile of water. Currently, nesting areas are located along: Burro, Canyon, Cibecue, Oak, Pinal, Tangle, Tonto, and Walnut creeks; Alamo, Apache, Bartlett, Crescent, Greer, Horseshoe, Lower Lake Mary, Luna, Lynx, Pleasant, Roosevelt, Saguaro, San Carlos, Talkalai, and Woods Canyon lakes or reservoirs; and the Agua Fria, Bill Williams, Little Colorado, Gila, Salt, San Carlos, San Francisco, and Verde rivers. Wintering populations of bald eagles occur statewide (Corman, 2005).

#### *Timeline and Cause for Listing*

Habitat alterations, persecution for feathers, and the use of DDT nearly eliminated the species. Protection against persecution in 1940 and the ban of DDT in 1973 has help the species population recover (Corman, 2005).

This species was listed as Endangered in 1978 and down listed to Threatened in 1995. The eagle was delisted on August 9, 2007. The Sonoran Desert Population was listed as Threatened on May 1, 2008. The Sonoran Desert Population was delisted in 2011 and is a State Species of Concern and a Tonto Forest Management Indicator Species. The bald eagle is protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, the Convention on International Trade in Endangered Species of Wild Flora and Fauna, and Arizona Revised Statute Title 17. (AGFD, 2011a)

In 2007, the U.S. Fish and Wildlife Service (USFWS) codified the definition of “disturb” under the BGEPA. Disturbance includes an action that “causes, or is likely to cause...injury to an eagle” or interference with “normal breeding, feeding, or sheltering behavior” causing a decrease in productivity or nest abandonment (USFWS 2007a, b). The USFWS also finalized regulations to provide a mechanism to authorize take under the BGEPA (USFWS 2009).

### *Habitat Requirements*

Breeding bald eagles are found near lakes, reservoirs, and perennial rivers throughout central Arizona where they perch in large riparian trees, pines, or on cliffs. Occupied breeding areas typically contain inaccessible substrates in which to construct their nests and nearby foraging areas with an abundance of prey items. Sixty-eight percent of Arizona's bald eagle breeding areas were located along lowland desert riparian corridors irregularly dominated by cottonwoods, willows, or sycamores. Many of these were near large reservoirs. An additional 20 percent were in pinyon pine/juniper-dominated areas and 12 percent were in ponderosa pine forests (Corman, 2005).

### *Breeding Biology*

Bald eagles nesting in Arizona typically stay within their breeding area throughout the year, but wintering populations usually head north out of the state in February and March. As with other southern populations, they begin breeding in midwinter to correspond with the spawn of their major prey item, fish. Bald eagle conduct courtship and nest building activities from November to February. Most eggs are laid from mid-December to March, with chicks hatching from mid-January through April. Nestlings in Arizona are known to fledge from April to mid-June. Studies have found that many of Arizona fledging bald eagles journey north in June-July to cooler localities in the Pacific Northwest, Intermountain West, and Canada. These juveniles return in late August and September, just before the 300+ wintering bald eagles begin arriving in October. In Arizona, bald eagles construct their large, bulky stick nests either on cliffs and pinnacles, or in large cottonwoods, willows, sycamores, and ponderosa pines.

Bald eagle clutches consist of 1-3 eggs, and both adults share incubation duties. Incubation lasts an average of 35 days, and the nestlings remain in the nest for approximately 12 weeks. The male typically conducts most of the foraging once the nestlings hatch, while the female defends the nest from intruders. The adults continue to feed the fledgling for approximately 45 days, at which time most young begin their journey north. Only one brood is produced per year, but they will occasionally renest if the clutch lost early during incubation (Corman, 2005).

### *Feeding Preferences*

Bald eagles have a diet comprised mainly of fish, followed by small mammals, carrion, and to a lesser extent various herps, such as the Sonora mud and spiny softshell turtles, and unidentified snakes that are usually dead. Fish consumption increases in the diet as the nesting season progresses, while the consumption of mammals declines. These eagles are also opportunistic, and will pirate meals from other raptors as well, such as Ospreys and other eagles (Corman, 2005).

### **Status of species in the action area**

- 27 bald eagle breeding areas occurred on the Tonto Forest in 2014 (McCarty, 2014)
- Wintering bald eagles occur within the Verde / Salt Rivers and Tonto Creek.
- 2013 documented occurrences of eagles were recorded in the Verde and East Verde Rivers within the Mazatzal Wilderness boundary.

- 2013 documented occurrences of eagles were recorded on the Salt River, Apache and Canyon Lakes bordering the Four Peaks Wilderness boundary.
- 2013 documented occurrences of eagles were recorded in the Salt River within the Salt River Canyon Wilderness.
- 2012 occurrences were documented just southeast of Hellsgate Wilderness within Tonto Creek.
- 2013 documented occurrences were recorded on the northwest corner of the Superstition Wilderness boundary at Canyon Lake.
- See Figures 2-5 for specific bald eagle locations within the analysis area.

## Effects Analysis

The USFWS codified the definition of “disturb” under the BGEPA. Disturbance includes an action that “causes, or is likely to cause...injury to an eagle” or interference with “normal breeding, feeding, or sheltering behavior” causing a decrease in productivity or nest abandonment (USFWS 2007a, b).

Proposed flights and landings within the analysis area are reflected in Table 5. Translocation capture projects would not typically occur in consecutive years due to recovery time for bighorn sheep herds to be sufficient enough to remove surplus animals that would not directly affect herd health. During those years, the anticipated number of helicopter landings would be ~30 for translocation projects. Based on past operations experience flights associated with landings are typically one to one.

Conservation measures described for bald and golden eagles are intended to minimize potential effects and provide a 2,000 foot lateral perimeter buffer for helicopters conducting bighorn sheep work from December 1 through June 30. The buffer is recognized by the Federal Aviation Administration and is sufficient to reduce effects from aircraft (Driscoll, 2006). It is expected that flight paths would vary depending on the mission and location of sheep. Therefore, it is likely that flight paths outside the month of November would vary, reducing potential negative effects to the species.

In addition, any flights between December 1 and June 30 would be coordinated with Arizona Game & Fish Nongame Raptor Management Program to ensure a 2,000 foot lateral perimeter buffer is maintained between aircraft and bald eagle nest sites and foraging areas. Foraging areas are generally associated with river systems or reservoirs, near the nest. Current species location data would help ensure a 2,000 foot buffer is achieved (Jacobsen, 2014). No additional effects would be anticipated to occur. As funding permits, the Arizona Game & Fish Nongame Raptor Management Program would continue to conduct monitoring on an annual basis for eagle occupancy and nesting sites (has occurred since the late 70's), which would help to ensure occupied sites are known.

## Determination of Effects

As a result of implementing the proposed action, **we believe the action would not cause disturbance or violate the Bald and Golden Eagle Protection Act** because sufficient conservation measures are in place, and current golden eagle information would be provided to the flight crew to avoid occupied nest locations and foraging areas each year.

We are subsequently seeking the U S Fish & Wildlife Service's Technical Assistance on our conservation measures and determination.

## Golden Eagle - (*Aquila chrysaetos*)

### *Historic and Current Status*

Braun et al. (1975) proposed as many as 100,000 individuals in North America in the 1970s. Olendorff et al. (1981), using data from USFWS aerial transect surveys in 1974-1978 and other data sources, estimated the wintering population of golden eagles in the western U.S. at 63,242 birds, with a potential 20,500 North American breeding pairs. Watson (1997) estimated the number of breeding pairs at 20,000-25,000 in North America. In 2003 the USFWS contracted with Western EcoSystems Technology, Inc. (WEST) to complete golden eagle aerial line transect surveys across much of the species' range in the western United States, with an estimated 27,392 golden eagles within the entire study area (Good et al. 2004, 2007). More recently, the surveys were expanded and repeated in 2006-2011, and estimates ranged from 18,858 to 24,206 total golden eagles within the study area (Nielson et al. 2012). Millsap et al. (2013) presented a composite analysis using the transect data in conjunction with Breeding Bird Survey data. Their results yielded similar population size estimates and further analyses indicated a generally stable population across the western U.S. over the past 40 years.

In Arizona, information on breeding golden eagles is limited. Studies have reported on golden eagle productivity in west-central Arizona (Millsap 1981), prey remains in nests (Eakle and Grubb 1986), and nest structure (Grubb and Eakle 1987). The Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005) found possible, probable, or confirmed evidence of breeding golden eagles in 187 of 1,834 (10.2%) priority blocks. Additional data was gathered during a 2006 Arizona Game and Fish Department (AGFD) survey effort, which found 14 occupied nests among 85 surveyed locations that had been identified as historic or current breeding areas. The Arizona Game and Fish Department December 2013 NGTR 277: Golden Eagle Nest Survey 2013 Page 2

2006 survey protocol, however, was limited to only 2 visits, in mid-April and mid-June, so occupancy-only and early failures were likely missed (AGFD unpublished data).

Intensive statewide nest surveys began in 2011, when the Bureau of Land Management (BLM) funded AGFD to conduct a two-year baseline inventory of potential nest sites primarily within and adjacent to proposed wind and solar energy project areas. In 2011-2012, AGFD surveyed suitable cliff-nesting golden eagle habitat via helicopter in western, northern, central, and southeastern Arizona, visiting 85 breeding areas (BAs) or historic BAs, and finding 67 new BAs and 305 potential BAs (McCarty and Jacobson 2011, 2012). Additional funding was provided by BLM for aerial occupancy surveys in 2013-2014 of known and potential BAs, and by the U.S. Forest Service (USFS) for a nest inventory in 2013 of the Tonto National Forest.

The 2013 golden eagle occupancy and nest survey effort totaled 122.9 hours (7,374 minutes) over 26 days, and included the examination of 75 breeding areas (BAs), 10 historic BAs, 114 potential BAs, and new suitable cliff nest habitat throughout Arizona. Surveys occurred in the northwest, central, and north central regions of the state. Significant findings included 101 total occupied BAs including 57 new BAs, and 62 new potential BAs with 84 large nests. Also, 45 active nests were opportunistically followed either to failure or through the early nestling stage, and 21 of these were confirmed failed (46.7%). All but one of the failures occurred after onset of incubation but prior to detection of hatching.

Of 75 BAs examined, 42 (56.0%) were found occupied by golden eagles and 33 (44.0%) were unoccupied. Among the occupied sites, 39 were active. When these breeding attempts were last observed, four were documented as successful (four nestlings seen at 80% of fledging age), 25 were still active, and 10 failed. All of the failures occurred after incubation was observed but prior to detection of hatching. Six other BAs were only checked once and were not included in summaries (two visits minimum to determine occupancy status).

Of 10 historic BAs examined, 2 (20.0%) were found occupied by golden eagles and 8 (80.0%) were unoccupied. Final status was not determined at the two active historic BAs, however at least 1 nestling hatched and reached 7 weeks of age. Five other historic BAs were only checked once and were not included in summaries (two visits minimum to determine occupancy status).

Of 114 potential BAs examined, 37 (32.5%) were found occupied by golden eagles and 77 (67.5%) were unoccupied. Among the occupied sites, 31 were active. When these breeding attempts were last observed, one was documented as successful (one nestling fledged), 20 were still active, and ten (32.3%) failed. All but one of the failures occurred after incubation was observed but prior to detection of hatching.

Of 20 newly discovered occupied BAs, 19 were active. When these breeding attempts were last observed, one was documented as successful (one nestling fledged and one foster-fledged), 17 were still active, and one (5%) failed prior to detection of hatching.

#### *Timeline and Cause for Listing*

In 1940, Congress passed the Bald Eagle Protection Act in an effort to provide protection for declining bald eagle populations (*Haliaeetus leucocephalus*). In 1962, the Act was amended to include golden eagles (*Aquila chrysaetos*), becoming the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250). In addition to the BGEPA, golden eagles are protected by the Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, the Convention on International Trade in Endangered Species of Wild Flora and Fauna, and Arizona Revised Statute Title 17.

In 2007, the U.S. Fish and Wildlife Service (USFWS) codified the definition of “disturb” under the BGEPA. Disturbance includes an action that “causes, or is likely to cause...injury to an eagle” or interference with “normal breeding, feeding, or sheltering behavior” causing a decrease in productivity or nest abandonment (USFWS 2007a, b). The USFWS also finalized regulations to provide a mechanism to authorize take under the BGEPA (USFWS 2009). The golden eagle is not listed under the Endangered Species Act.

#### *Habitat Requirements*

They are usually found in open country, in prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. They nest on rock ledges, cliffs or in large trees. The pair may have several alternate nests and they may use the same nests in consecutive years or shift to alternate nest used in different years. In Arizona they are found in mountainous areas and are virtually vacant after breeding in some desert areas. (AGFD, 2011).

The Golden Eagle's territory size in several areas of the western U.S. averaged 22-55 sq miles (57-142 sq km). Northernmost populations withdraw southward for the winter (some individuals may remain in the north) and they return to their northern breeding areas in March-April. They tend to vacate hot deserts during the summer. They can dive at tremendous speeds at a prey animal or in play, traveling in its stoop at an estimated speed of 150-200 m.p.h. Their flight speed during gliding and flapping is 28-32 m.p.h.

### *Breeding Biology*

The dates for laying the eggs vary depending on the location but for California to Texas the peak is late February to March. The clutch size is 1-3, rarely 4 (usually 2). The incubation period is about 43-45 days and is done mostly by the female. The eggs are dull, white spotted and blotched or freckled with brown or red brown. The young can fly at 60-77 days and the parents care for them for another 30+ days. The older stronger eaglet will often kill smaller nest mates and adults do nothing to prevent it. The family units sometimes stay together for several months. They typically first breed in their fourth or fifth year. Lifelong monogamy may be the rule, though some apparent exceptions have been recorded. In western mountains, nests were built at elevations between 4,000-10,000 ft (1219-3048 m).

The distance between active nests almost never less than .5 mile (0.8km). The nest can be 8-10 ft (2.4-3 m) across and 3-4 ft. (.9-1.2 m) deep, as the site allows. The nest is made from a foundation of sticks, weeds, brush, roots, twigs, lined with soft mosses, lichens, down, and fur. The pair often adds leafy green branches to the nest. Other nests may be a mere scrape on a shelf or a cliff with a circle of branches surrounding it. Their courtship display is similar to that of the Buteos. It consists mainly of spectacular flight maneuvers, spiral sailings in ever-rising circles in which the birds frequently come together and then drift apart (AGFD, 2011).

### *Feeding Preferences*

The Golden Eagle is a carnivore that feeds mainly on small mammals like rabbits, marmots and ground squirrels. They may also eat insects, snakes, birds, juvenile ungulates and carrion. They can fast for days between feedings. They hunt while soaring or from their perch and they may hunt cooperatively. They commonly hunt in the early morning and early evening (AGFD, 2011).

### **Status of the Species in the Action Area**

- 32 golden eagle breeding areas occurred on the Tonto Forest in 2014 (McCarty, 2014).
- An additional 49 potential golden eagle breeding areas occurred on the Tonto Forest in 2014 (McCarty, 2014).
- See Figures 2-5 for specific golden eagle locations within the analysis area.

### **Effects Analysis**

The USFWS codified the definition of "disturb" under the BGEPA. Disturbance includes an action that "causes, or is likely to cause...injury to an eagle" or interference with "normal breeding, feeding, or sheltering behavior" causing a decrease in productivity or nest abandonment (USFWS 2007a, b).

Proposed flights and landings within the analysis area are reflected in Table 5. Translocation capture projects would not typically occur in consecutive years due to recruitment and recovery time for bighorn



sheep herds to be sufficient enough to remove surplus animals that would not directly affect herd health. During those years, the anticipated number of helicopter landings would be ~30 for translocation projects. Based on past operations experience flights associated with landings are typically one to one.

Conservation measures described for bald and golden eagles are intended to minimize potential effects and provide a 2,000 foot lateral perimeter buffer for helicopters conducting bighorn sheep work from December 1 through June 30. The buffer is recognized by the Federal Aviation Administration and is sufficient to reduce effects from aircraft (Driscoll, 2006). It is expected that flight paths would vary depending on the mission and location of sheep. Therefore, it is likely that flight paths outside the month of November would vary, reducing potential negative effects to the species.

In addition, any flights between December 1 and June 30 would be coordinated with Arizona Game & Fish Nongame Raptor Management Program to ensure a 2,000 foot lateral perimeter buffer is maintained between aircraft and golden eagle nest sites and foraging areas. Foraging areas are generally associated with river systems or reservoirs, near the nest. Current species location data would help ensure a 2,000 foot buffer is achieved (Jacobsen, 2014). No additional effects would be anticipated to occur. As funding permits, the Arizona Game & Fish Nongame Raptor Management Program continues to conduct monitoring on an annual basis for eagle occupancy and nesting sites, which would help to ensure occupied sites are known.

### **Determination of Effects**

As a result of implementing the proposed action, **we believe the action would not cause disturbance or violate the Bald and Golden Eagle Protection Act** because sufficient conservation measures are in place, and current golden eagle information would be provided to the flight crew to avoid occupied nest locations each year.

We are subsequently seeking the U S Fish & Wildlife Service's Technical Assistance on our conservation measures and determination.

### **Mexican Spotted Owl – (*Strix occidentalis lucida*)**

#### *Historic and Current Status*

The Mexican spotted owl (MSO) occurs in forested mountains and canyonlands throughout the southwestern U.S. and Mexico. It ranges from Utah, Colorado, Arizona, New Mexico, and the western portions of Texas south into several States of Mexico (USFWS 2012). Whereas this owl occupies a broad geographic area, it does not occur uniformly throughout its range (USFWS 1995). Instead, the owl occurs in disjunct areas that correspond with isolated mountain ranges and canyon systems. In Arizona the species is patchily distributed in forested mountains statewide, along with steep canyons on the Colorado Plateau including the Grand Canyon. They have been found in the following counties: Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, and Yavapai (AGFD, 2005).

#### *Timeline and Cause for Listing*

The species was listed as a threatened species in 1993 and critical habitat for the Mexican spotted owl was designated on August 31, 2004. The primary reasons for listing were the historical alteration of its habitat as a result of timber management practices, the threat of these practices continuing as evidenced in existing national forest land and resource management plans, and the danger of stand-replacing wildland fire. The Final Revised Recovery Plan was issued in December 2012 and includes updated species information, habitat definitions, management recommendations, and desired conditions for owl habitat. The Revised Recovery Plan also identifies recovery criteria and actions needed to ensure the recovery of the Mexican spotted owl.

### *Habitat Requirements*

They primarily breed in dense old growth mixed-conifer forests located on steep slopes, especially deep, shady ravines. These sites have high canopy closure, high basal area, many snags, and many downed logs. For foraging, multistoried forest with many potential patches is desirable. In Arizona, they occur in mixed-conifer, pine-oak, evergreen oak forests, and rocky canyonlands. In Arizona, they generally foraged more than or as frequently as expected (based on availability) in mixed-conifer forests. Range size for single owls in Arizona averages 1,600 acres and combined home ranges occupied by pairs averages 2,000 acres.

MSO nest and roost primarily in closed-canopy forests or rocky canyons. In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, nests appear to be in trees. Nest trees are usually large in size, whereas roosting occurs in both large and small trees. Nest tree species vary somewhat among areas and habitat types, but available evidence suggests that Douglas-fir is the most common species of nest tree (HDMS, 2005).

### *Breeding Biology*

MSO's do not build their nests. In Arizona, they use cavities or abandoned platform nests, however, they also use ledges on cliffs or pothole sites, and dwarf mistletoe induced witches' brooms. They are monogamous, breeding sporadically, and generally not nesting every year. In good years most of the population will nest, whereas in other years only a small proportion of pairs will nest. They have one brood, with egg laying peaking sometimes as early as early March in Arizona and New Mexico. They lay 1-3 (usually 2) faintly buff, unmarked eggs that are 5.0 cm (2.0 in.) long. Incubation by female lasts 28-32 days. Hatching usually occurs in early to mid-May. Young have eyes closed at hatching, are immobile and downy. Male feeds female and young until young are two weeks old. Young leave the nest at about 5 weeks (June), and fly at about 6-7 weeks of age. They stay near the nest for several weeks, and are fed by the adults until late summer, and are independent by early fall (dispersal of young occurs in September-October). Adults breed at 2-3 years of age, but may not breed every year. Reproductive success is generally low, with average number of young fledged per pair at about 1.0 (HDMS, 2005).

### **Status of the Species in the Action Area**

- The Four Peaks and Mazatzal Wilderness contains MSO protected (occupied) and recovery habitat. The most recent documented occurrence of the owl in the Mazatzal Wilderness was recorded in 2003. Six protected activity centers (PACs) occur within the Mazatzal wilderness boundary. The documented occurrence within the Four Peaks Wilderness was last recorded in

1994. One PAC occurs within the Four Peaks wilderness boundary. One PAC occurs in the Superstition Wilderness.

- Other areas identified in the proposed action do not contain known occurrences for the Mexican spotted owl. This is primarily due to a lack of survey, not because the areas have been surveyed and there are no owls there.
- The Tonto National Forest Supervisors office would provide updated MSO data to Arizona Game and Fish, Region VI, and the FWS annually.

**Table 6. Mexican Spotted Owl PAC Information**

<b>PAC Name</b>	<b>Number</b>	<b>Last Survey</b>	<b>Occupancy</b>	<b>Habitat Type</b>	<b>Notes</b>
Log Trough	120301	1994	P	Ponderosa Pine/Canyon	No specific habitat information on this PAC.
Barnhardt	120418	2009	NR	Ponderosa Pine/Riparian/Canyon	Burned in the Willow Fire and found in steep canyon
North Fork Deadman	120417	2008	M	Ponderosa Pine/Riparian/Canyon	Burned in the Willow Fire and found in headwaters of Deadman Creek
Y Bar Basin	120606	1992	O-NU	Chapparal, Ponderosa Pine/Oak, and Mixed Conifer	Remote and steep canyon. Difficult to access, yet easy to call.
Deer Creek	120603	2007	F	Mixed Conifer/Riparian	Easily accessible off the 201 road. Has burned in the Willow fire (2004) and the Sunflower fire (2012)
Maple Draw	120607	2007	F	Mixed Conifer/Riparian	Easily accessible off the 201 road. Has burned in the Willow fire (2004) and the Sunflower fire (2012)
Pigeon Springs	120605	2002	O	Mixed Conifer/Ponderosa Pine/Riparian	Easily accessible off the 201 road. Has burned in the Willow fire (2004) and the Sunflower fire (2012)
Four Peaks	120602	1994	O-NU	Ponderosa Pine/Oak/Aspen	Accessible. Has not been surveyed due to high severity burn from Lone Fire (1996). Habitat is recovering and has had the recent Browns Fire (2014).

**LEGEND:**

- O= Pair Occupancy inferred or confirmed  
M= Male inferred or confirmed  
F= Female inferred or confirmed  
O= Pair Occupancy inferred or confirmed  
M= Male inferred or confirmed  
P= Presence of a single owl inferred or confirmed sex unknown

Y= Number of young fledged  
 YD= Number of young found dead  
 NI= No Information  
 NU= Nesting status undetermined  
 NY= Nesting status undetermined no young produced  
 NN= Non-nesting/Non-reproduction confirmed  
 NA= Nest Abandoned  
 NF= Nest Failed  
 A= Audio detection of MSO at night only - not found on follow-up or during additional surveys  
 NR= Formally monitored - no MSO response  
 IM-NR= Informally monitored - no MSO response or location

## Effects Analysis

The MSO Revised Recovery Plan (USFWS 2012) provides the following account of potential noise disturbance:

Infrequent, noise-producing activities are generally assumed to have relatively little long-term impact on spotted owls. However, owls will react to noise disturbances by changing behavior and/or flushing from their perches (Delaney et al. 1999a; Swarthout and Steidl 2001, 2003). These behavioral responses may alter nesting and roosting activities, thus increasing vulnerability to predators and heat-related stress. Variables such as distance to and frequency of a noise disturbance, habitat type, topography, and sound source may influence spotted owl responses (Delaney and Grubb 2004).

For example, noises close to nests are likely to be more disruptive than those far from nests (Delaney et al. 1999a) and noise disturbances close (96 m [315 ft]) to owl nests may have affected prey delivery rates (Delaney et al. 1999b). The 345 ft (105 m) hemispherical protection zone would provide greater assurance that aircraft noise would not likely negatively impact prey delivery. Additionally potential negative effects for prey delivery are further reduced because helicopter noise would initially be at lower decibel levels and increase as the helicopter approaches. The gradual increase in decibel levels from approaching aircraft is not expected to have negative impacts to prey delivery to the extent that sustained, sudden increases in noise, such as use of chain saws might have. In addition, helicopter noise would not be sustained long term and is expected to be of short duration due to the nature of the operations which dictate expeditious completion of the mission(s) to minimize stress to sheep. Also with respect to distance and noise levels, Delaney et al. (1999a) determined that the proportion of owls flushing was negatively related to distance (owls flushed more often to closer sounds) and positively related to noise level (owls flushed more often to louder sounds). Pater et al. (2009) quantified this in part by determining that noises  $\geq 80$  dBO (i.e., decibels weighted for middle sound frequencies where owl hearing is the most sensitive), had a greater than 0.60 probability of causing an owl to flush. This noise level (80 dBO) is roughly equivalent to 69 dBA (i.e., decibels weighted for human hearing) or approximately twice as loud as ordinary conversation. The origin or type of noise may also be a factor in disturbing owls. Mexican spotted owls in forested environments reacted more to chainsaws (operated out of sight of owls) than to the sound of helicopters at the same distance (Delaney et al. 1999a).

While little research is available comparing the relative impact of various noise types, it is likely that persistent noises are more disruptive than infrequent disturbances, and intensity of disturbance is proportional to noise level (i.e., sound volume). There is also the potential for noise pollution (i.e., consistent noise-causing activities as opposed to the sporadic noise disturbances discussed above) to impact spotted owl nocturnal breeding and foraging habits. Because owls are active at night when it is difficult or impossible to see other owls, audio communication is a critical component of the owl's social system (Frid and Dill 2002; e.g., territorial defense, pair bonding and maintenance, feeding nestlings, and post-fledging activities). Further, owls depend heavily on sound to locate and capture prey in near darkness (Payne 1971, Martin 1986, Norberg 1987). No studies have been conducted on the influence of habitat type (canyon vs. forest) on noise disturbance to owls. While both forest- and canyon-dwelling owls respond to human presence, potentially disruptive interactions between humans and owls may be more likely in canyons because canyons can amplify noises (especially in caves) and provide limited escape routes for owls. In addition, the number of sites in canyons that afford spotted owls adequate thermal protection for nesting and roosting may be more limited than in forested environments. Finally, canyons may lack visual barriers between owls and noise sources that are common in dense forests, and this also may influence owl responses. Noise impacts are most likely to occur at the level of individual owls and/or PACs, and they may be important to small isolated populations (USFWS, 2012).

Proposed flights and landings within the analysis area are reflected in Table 5. Capture projects would not typically occur in consecutive years due to recruitment and recovery time for bighorn sheep herds to be sufficient enough to remove surplus animals that would not directly affect herd health. During those years, the anticipated number of helicopter landings would be ~30 for translocation projects. Based on past operations experience flights associated with landings are typically one to one. Up to 60 flights may occur during the month of November, prior to breeding and incubation. Up to 30 flights may occur any other time of the year, although experience has shown that a limited number of landings would occur due to low number of mortalities, telemetry collars malfunctions and/or defects. Since 2010, there has only been one landing outside November within the Tonto National Forest to retrieve a telemetry collar although that number may increase due to proposed projects. For the most part, the proposed action should have limited effects to Mexican spotted owls because AGFD will avoid flying through or over occupied or possibly occupied (nest/roost recovery habitat) within the project area during the breeding season (see conservation measures). In addition, most flights that could occur near PACs (occupied) or suitable nesting habitat (nest/roost recovery habitat) would occur outside the breeding season. The overall avoidance of these areas during the breeding season should result in insignificant and discountable noise affects to owls. In addition, the AGFD contractors often use the Airbus Eurocopter AS350 B3 helicopters that are designed to produce less noise than conventional helicopters thus further reducing potential negative effects to the species.

All areas proposed for landing are outside PACs and nest/roost recovery habitat. This includes the Parker Creek/Canyon area that falls outside of wilderness. Due to steep / rugged topography in Parker Canyon, helicopters are unable to land in MSO suitable habitat (steep canyon, forested habitat) in that area. Typical MSO habitat is forested and/or steep canyon walls further limiting negative visual effects to the species from the aircraft. Landings would typically be in flat areas that do not contain the key habitat elements typically found in nest/roost habitat. Therefore, helicopter landings should not result in noise effects to MSO. Flights would be routed to avoid any areas known to be occupied by MSO (PACs) or nest/roost recovery habitat during the breeding season (March – August). A  $\geq 345$  hemispherical

protection buffer around PACs and nest/roost recovery habitat would be utilized to minimize disturbance to MSO if flights occur during the breeding season. The  $\geq 345$  foot hemispherical protection buffer has been determined to be sufficient to greatly reduce negative noise effects to the species from helicopters (Delaney et al. 1999). Helicopter landings would not occur within PACs or in un-surveyed suitable breeding or nesting habitat. Retrieval of radio collars is expected to be limited to one or two occurrences over the life of the project based upon past experience which will further reduce potential effects to MSO. In the event that retrieval of a collar may have potential conflicts with PACs and nest/roost recovery habitat Arizona Game and Fish, Region VI will provide a report to the Tonto Forest to assess need for possible reinitiation.

In the event that bighorn sheep management activities would be required in MSO PAC or nest/roost recovery habitat, such as, an immediate response due to mortality investigations, landings would occur within flat areas outside of potential MSO nest/roost habitat. The flight crew would access the area by foot (1-2 people); other non-critical management activities would be considered to be performed outside of the MSO breeding and nesting period. Flights would occur only during daylight hours which would reduce impacts to the species diurnal and nocturnal breeding, foraging habits or audio communication. Aircraft avoidance and  $\geq 345$  foot buffer of these areas would help ensure minimization of potential negative effects due to noise resulting in a flushing response, reduced prey delivery rates, and reduce potential negative visual effects.

No additional effects from the proposed action are anticipated.

### **Determination of Effects**

It is my determination that the proposed action within portions of the Four Peaks, Hellsgate, Mazatzal, Salt River Canyon and Superstition Wilderness and other areas for the purposes of bighorn sheep management, **May affect, not likely to adversely affect**, Mexican Spotted Owl.

### **Morafka's Desert Tortoise – (*Gopherus morafkai*)**

#### *Historic and Current Status*

The distribution of the desert tortoise covers the broadest range of latitude, climate, habitats, and biotic regions of any North American tortoise. The tortoise ranges from northern Sinaloa north to southern Nevada and southwestern Utah, and from south central California east to southeastern Arizona. The desert tortoise is divided into 2 populations for purposes of the Endangered Species Act: the threatened Mojave population occurs north and west of the Colorado River, and the candidate Sonoran population occurs south and east of the Colorado River.

In Arizona the Sonoran desert tortoise (SDT) population includes those tortoises south and east of the Colorado River, from locations near Pearce Ferry in Mohave County, to the south beyond the International Boundary, and at many scattered locations in between. The northeastern-most SDT records in Arizona occur along the Salt River near Roosevelt Lake in Gila County, although populations here have not been confirmed with recent observations. The middle San Pedro River drainage in Cochise County harbors the eastern-most substantial SDT populations. Desert tortoise observations have been

confirmed in extreme southeastern Cochise County, but most probably represent released captives (pets). Sonoran desert tortoises have been found as far southwest as the Barry M. Goldwater Range, Yuma Proving Ground, and the Cabeza Prieta National Wildlife Refuge.

#### *Timeline and Cause for Listing*

The Sonoran population was given Candidate status December 14, 2010.

#### *Habitat Requirements*

Adequate shelter is one of the most important habitat features of tortoises in the Sonoran Desert (Averill-Murray et al., 2002). Tortoises escape extreme temperatures in shelters, which stay cooler in the summer and warmer in winter than outside temperatures. Tortoises require loose soil in which to excavate (usually shallow) burrows below rocks and boulders, but they may also use rock crevices which they may or may not be able to modify. Tortoises occasionally burrow under vegetation, less often dig soil burrows on more or less open slopes, and also use caliche caves in incised wash banks. They will also rest directly under live or dead vegetation without constructing a burrow.

Activity begins in the spring as temperatures warm, then decreases as the season moves into the summer drought in May and June (Averill-Murray et al., 2002). Much more time is spent inactive in shelters where they conserve water and energy. The onset of the summer monsoon season signals the beginning of peak tortoise activity, with tortoises responding to summer rains to rehydrate and establish positive moisture and energy balances, dramatically rising in early August and peaking during August-September (Averill-Murray et al., 2002). Activity decreases sharply after mid-October, as tortoises withdraw to winter hibernacula, which are similar shelters to those they use during activity seasons (Averill-Murray et al., 2002). Even during the winter, some individuals may bask, move, or even forage on warm winter days. Females may terminate hibernation as early as late February, while some males may remain inactive through the entire spring (Bailey 1992; Martin 1995; Vaughan 1984).

Males typically reach larger sizes than females throughout the Sonoran Desert and sexual maturity is attained at sizes as small as 176 mm. Various carnivores, including mountain lion (*Puma concolor*), coyote (*Canus latrans*), kit fox (*Vulpes macrotis*), and bobcat (*Felis rufus*), may prey on hatchlings, juveniles, or eggs, or kill adults by chewing exposed limbs. Other potential predators of smaller tortoises include golden eagle (*Aquila chrysaetos*) and the common raven (*Corvus corax*).

#### *Breeding Biology*

Mating occurs during the summer monsoon season. Females begin laying eggs, which are fertilized by sperm stored from the previous summer's mating, just before or during the onset of the summer rains, in late June or early July (Averill-Murray and Klug 2000). They lay only one clutch of about 6 eggs, but 3-12 eggs in a clutch have been reported. The proportion of females reproducing is related to the amount of recent rainfall and vegetation available for forage. Females usually lay their eggs

inside burrows with adequate soil development, and many remain at and defend their nests against predators.

#### *Status of the species in the action area*

- Documented occurrences and suitable habitat occurs within the Four Peaks, Mazatzal and Superstition Wilderness areas.

### **Effects Analysis**

Aircraft and associated personnel may conduct bighorn sheep management activities within suitable and / or occupied tortoise habitat. The majority of flights would occur during November and to a lesser extent, other times of the year and may temporarily cause individuals to avoid the affected area due to wind, noise and human presence. Operations would be of limited duration and would primarily occur in open areas. Conservation measure designed to minimize potential impacts to tortoise involves safe helicopter operations including landing in areas with large amounts of bare ground when possible, which would allow the crew and pilot clear view of the landing area and route to capture area to minimize potential conflicts with tortoise(s). There is a low probability of encountering tortoises where bighorn sheep occur, due to difference in habitat preferences. In the event tortoises are encountered, direct and/or indirect effects may include: ground crew activities, placement of the skids during landing and rotor wash. The pilot and flight crew look for physical obstructions that would potentially impact the safe landing of the helicopter (ie. landing skids, tail rotor coming in contact with rocks, vegetation, etc.) thus providing additional assurance that tortoises may not be impacted by landings or ground crew activities. In the rare event a tortoise is encountered during capture activities, guidelines would be followed for handling the tortoise, although handling would be the last resort. Additionally, flight crews would visually monitor the area prior to landing and capture to avoid any potential effects to the species. Protective measures would be consistent with the Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (<http://www.azgfd.gov/hgis/pdfs/Tortoisehandlingguidelines.pdf>).

No additional effects from the proposed action are anticipated.

### **Determination of Effects**

As a result of implementing the proposed action, we have determined that the proposed action may impact individuals of Morafka's desert tortoise within the Mazatzal, Superstition and/or Four Peaks Wilderness areas, but would **"not be likely to lead to a trend toward federal listing"**.

We are subsequently seeking the U S Fish & Wildlife Service's Technical Assistance on our conservation measures and determination.

### **Cumulative Effects**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this section because they will be subject to separate consultation pursuant to Section 7 of the Act.



Portions of the analysis area are within wilderness and some are adjacent or near wilderness with exception of the area west of State Route 288 between the Sierra Ancha and Salome Wilderness areas and area between the Four Peaks and Superstition Wilderness and area south of the Superstition Wilderness. Areas outside wilderness are often accessible by motorized vehicles and can have fairly high visitation by the public. Areas within wilderness tend to have lower visitation rates due to restrictions on motorized access, remoteness and rough terrain.

Many recreational activities occur within the analysis area such as Off Highway Vehicle (OHV) use (i.e. all-terrain vehicle (ATV), motorcycles), horseback riding, target shooting, hunting, fishing, hiking, camping and nature viewing. Some commercial activities are permitted within the analysis area such as river rafting, hunting/ fishing guide activities and recreational tubing to name a few.

Search and recovery activities occur on a frequent basis due to proximity to Phoenix and corresponding high recreation use. Agencies involved in search and rescue activities vary depending on the situation and location. Generally speaking search and rescue activities are carried out by County Sheriff, Arizona Department of Public Safety, local police departments and the Forest Service.

Air traffic in the analysis area varies greatly depending on proximity to Phoenix and associated flight paths. Non-commercial flights occur regularly within the analysis area and have presented challenges over wilderness areas due to low flying aircraft. Commercial flights in the area are generally high elevation on the approach to Phoenix or other airports in the area. Arizona Game and Fish Department conducts game surveys by air on a regular basis and would continue to do so in order to determine wildlife population status and trends in accordance with existing compliance requirements.

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## Signature Page

Prepared and Approved by:

I prepared this Biological Assessment. It is my determination that helicopter flights to support bighorn sheep management efforts by Arizona Game and Fish Department on Tonto National Forest may affect, not likely to adversely affect Mexican spotted owl, would not cause disturbance or violate the Bald and Golden Eagle Protection Act for the golden eagle and bald eagle and would not likely trend toward federal listing for Morafka's desert tortoise.

/s/ *Todd Willard*

September 22, 2014

Todd Willard, Cave Creek District Biologist  
Tonto National Forest

Date

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